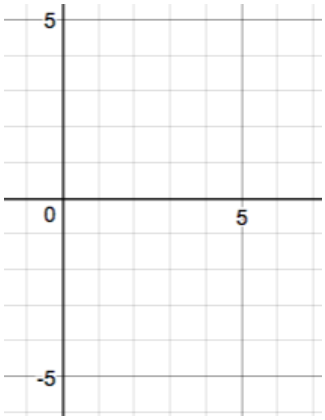
Algebra 1 Name _____

4-5 Systems of Linear Inequalities Date _____ **A#3**

Goal: To graph and solve a system of linear inequalities.

I. Warm Up: Graph the system below.

$$y = x - 1$$
$$y = -2x + 4$$



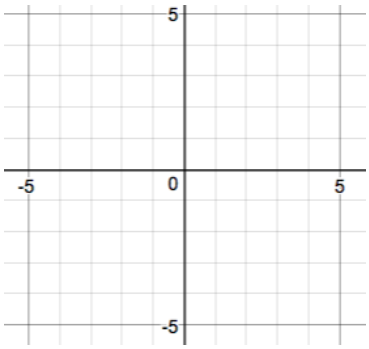
a. Choose one point above $y = x - 1$ and one below. Which point satisfies $y < x - 1$ and which satisfies $y > x - 1$?

b. Choose one point above $y = -2x + 4$ and one below. Which point satisfies $y < -2x + 4$ and which satisfies $y > -2x + 4$?

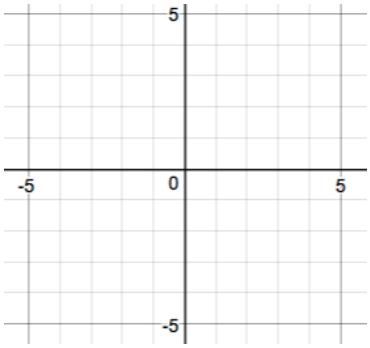
II. Graph a System of Linear Inequalities

Ex 1: What are the solutions to the system: $\begin{matrix} y > x - 2 \\ y \le -x + 1 \end{matrix}$?

Steps:
1. Graph each corresponding equation
2. Shade the overlap region
3. Check a point

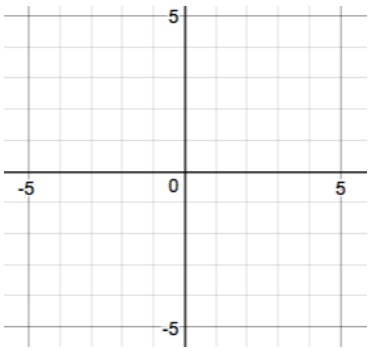


Try It! Find the solutions to $\begin{matrix} y \ge -2x + 1 \\ y > x + 2 \end{matrix}$ and check one point.

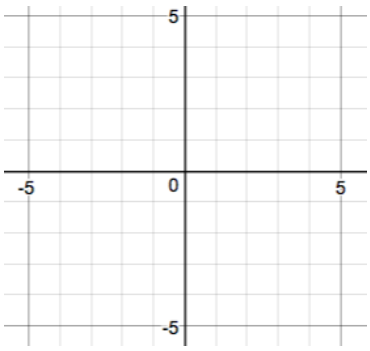


Ex 2: Is it possible to have no solutions?

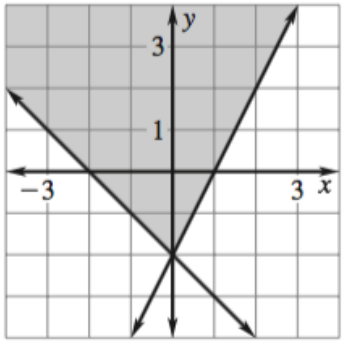
Graph the solutions to $\begin{cases} y \geq -x+2 \\ y < -x-2 \end{cases}$.



Try It! Graph the solutions to the system: $\begin{cases} y < -3 \\ y \geq 2 \end{cases}$

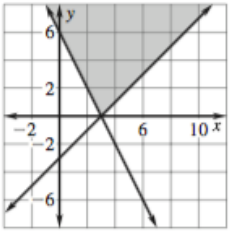


Ex 3: Write the system of inequalities from the graph.

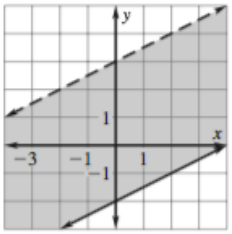


Try It! Write the system of inequalities from each graph.

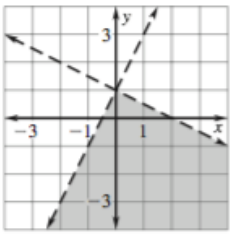
4.



5.

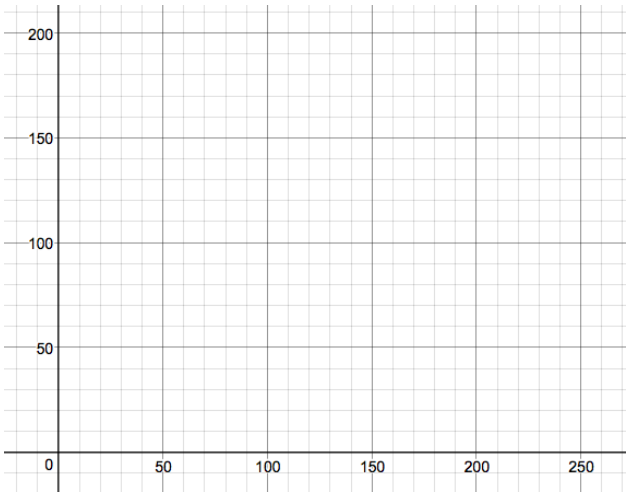


6.



Algebra 1
4-5 Systems of Linear Inequalities **A#3**

III. Application: Malia has $500 to purchase water bottles and pairs of socks for a fundraiser for her school's cross-country team. She needs to buy a total of at least 200 items without buying too many of just one item.
What graph shows the possible numbers of water bottles and pairs of socks that Malia should buy?



Interpretation:

Try It! You work at a frozen yogurt shop during the summer. You need to order 5-ounce and 8-ounce cups. The storage room will only hold 10 more boxes. A box of 5-ounce cups costs $100 and a box of 8-ounce cups costs $150. A maximum of $1200 is budgeted for yogurt cups. Write a system of linear inequalities that shows the number of boxes of 5-ounce and 8-ounce cups that could be bought. Graph your result. Give 3 options you have.